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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Matsumoto, K.) Group Art Unit : 1655
Appl. No. : 09/771,439)
Filed : January 26, 2001)
For : **METHOD FOR SEPARATING**)
 AND COLLECTING NUCLEIC)
 ACIDS)
Examiner : Zitomer, S.)

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AMENDMENT

Assistant Commissioner for Patents
Washington, D.C. 20231

Dear Sir:

In response to the Office Action mailed June 28, 2001, Applicants respectfully request the Examiner to enter the following amendments and consider the following arguments.

IN THE CLAIMS:

Please amend claims 1 and 5-8 as follows:

Claim 1. (Amended) A method for separating and collecting nucleic acids, which comprises:

bringing a sample nucleic acid solution into contact with a nucleic acid-immobilized substrate comprising a substrate and single-stranded nucleic acids having different nucleotide sequences, said single-stranded nucleic acids being each separately immobilized on the substrate, whereby immobilized portions of the immobilized nucleic acids are provided on the nucleic acid-immobilized substrate, to allow hybridization of the immobilized single-stranded nucleic acids and single-stranded nucleic acids complementary to the immobilized single-stranded nucleic acids and contained in the sample nucleic acid solution, and

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separating the hybridized single-stranded nucleic acids on the immobilized portions of the immobilized nucleic acids from the substrate, thereby collecting the hybridized single-stranded nucleic acids without disassembling the nucleic acid-immobilized substrate,

wherein the hybridized single-stranded nucleic acids are separated by a means selected from the group consisting of:

- (1) rubbing off the immobilized portions;
- (2) shaving off the immobilized portions; and
- (3) applying an electric potential difference across the immobilized portions.

Claim 5. (Amended) The method according to claim 1, wherein the substrate has a plate shape.

Claim 6. (Amended) The method according to claim 2, wherein the substrate has a plate shape.

Claim 7. (Amended) The method according to claim 3, wherein the substrate has a plate shape.

Claim 8. (Amended) The method according to claim 4, wherein the substrate has a plate shape.

REMARKS

Claims 1 and 5-8 have been amended. Claims 1-8 are now pending in this application. Support for the amendments is found in the existing claims and the specification as discussed below. Accordingly, the amendments do not constitute the addition of new matter. Applicant respectfully requests the entry of the amendments and reconsideration of the application in view of the amendments and the following remarks.

The specific changes to the specification and the amended claims are shown on a separate set of pages attaches hereto and entitled VERSION WITH MARKINGS TO SHOW CHANGES MADE, which follows the signature page of this Amendment. On this set of pages, insertions are underlined and deletions are struck through.

Rejection under 35 U.S.C. § 112, second paragraph

Claims 1-8 are rejected under 35 U.S.C. § 112, second paragraph on a variety of grounds (a) - (f) on page 2 to page 3, line 3 of the Office Action. These grounds of rejection are believed to be overcome by Applicant's amendment. Support for the specific separation means (1) to (3) in amended claim 1 is found in the present specification at page 18, lines 4-11 and page 19, lines 12-22.

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Regarding point (d), Applicant would like to clarify that the hybridized nucleic acid may be separated either in denatured form or in hybridized form. See the present specification at page 18, line 3 to page 19, line 22.

Regarding point (f), Applicant has amended claims 5-8 to recite "plate" rather than "plate-like". It is submitted that the meaning of the term "plate shape" would be apparent to one skilled in the art in the context of the present invention.

In view of Applicant's amendments and comments, it is respectfully submitted that the rejection under 35 U.S.C. § 112, second paragraph has been overcome.

Rejection under 35 U.S.C. § 102(e)

Claims 1 and 3-8 are rejected under 35 U.S.C. § 102(e) as anticipated by Mills, Jr., et al. '102. It is respectfully submitted that Mills, Jr., et al. does not anticipate the present claims. Mills, Jr., et al. do not teach the specific means of separating the hybridized single-stranded nucleic acids as recited in claim 1 as amended.

In view of Applicant's amendment, withdrawal of this ground of rejection is respectfully requested.

Rejection under 35 U.S.C. § 103(a)

Claims 1-8 are rejected under 35 U.S.C. § 103(a) as unpatentable over Mills, Jr. et al. as applied to claims 1 and 3-8 under 35 U.S.C. § 102(e) in view of Takenishi et al. However, Mills Jr., et al. do not teach or suggest Applicant's presently claimed invention.

Mills Jr., et al. do not teach or suggest separation of the hybridized single-stranded nucleic acids by a means selected from the group consisting of rubbing off the immobilized portions, shaving off the immobilized portions and applying an electric potential difference across the immobilized portions as set forth in claim 1 as amended.

In contrast, Mills Jr., et al. teach the release of selected oligomers by local denaturation (col. 13, line 17), preferably by local heating (col. 13, line 33). The released oligomers are then collected by "collecting the solution in contact with the treated depot surfaces" (col. 15, lines 1-2). There is nothing in the Mills Jr. et al. reference that would motivate one of ordinary skill in the art to separate the hybridized single-stranded nucleic acids by the means set forth in claim 1 as amended.

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Takenishi et al. is cited for their teaching on immobilization of nucleic acids on a substrate carrying a carbodiimide group. However, there is nothing in the Takenishi et al. reference that corrects the deficiencies of the primary reference.

In view of Applicant's amendments and arguments, reconsideration and withdrawal of this ground of rejection is respectfully requested.

CONCLUSION

In view of Applicants' amendments to the claims and the foregoing Remarks, it is respectfully submitted that the present application is in condition for allowance. Should the Examiner have any remaining concerns which might prevent the prompt allowance of the application, the Examiner is respectfully invited to contact the undersigned at the telephone number appearing below.

Respectfully submitted,

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Dated: October 26, 2001

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